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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/668,818

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Robert R. Rice

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04/29/2008

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EXAMINER

BELLO, AGUSTIN

ART UNIT

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2613

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/668,818	Applicant(s) RICE ET AL.	
	Examiner Agustin Bello	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/17/08 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 21-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 21 and 30 recite a sequence of short light pulses at a data rate of at least 10 ***gigabytes*** per second. However, the specification does not support this data rate. In fact, the only data rate that appears to be supported by the specification is on the order of 10 ***gigabits*** per second.

4. Claims 21-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with

Art Unit: 2613

which it is most nearly connected, to make and/or use the invention. The specification is silent as to how a data rate of 10 gigabytes per second is achieved.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 21-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant recites in the preamble of claims 21 and 26 a data rate of at least 10 ***gigabits*** per second. The applicant then goes on to claim a data rate of at least 10 ***gigabytes*** per second. The preamble and the limitations in the body of the claim directly contradict each another.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 21-22, 25-28, 31-35, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numata et al. (U.S. Patent Application Publication No. 2002/0105704) in view of Siegman (U.S. Patent No. 6,751,388) and Aoki (U.S. Patent No. 6,757,499).

Regarding claims 21, 26, 31, 33, 34, and 37, Numata teaches a light source (reference numeral 111 in Figure 1) for transmitting data from a source as a first light signal, wherein the first light signal comprises a sequence of short light pulses (paragraph [0008]); a lens (reference numeral 112 in Figure 1) having a focal length, placed in a path of said first light signal at a

distance of approximately said focal length from an end of said LCMFOC (reference letter Z1 in Figure 2), wherein the lens is located to receive said first light signal from said light source and to focus said short light pulses onto the end of the LCMFOC such that a diameter of focused short light pulses is approximately equal to a core diameter of the LCMFOC to excite low fiber modes and minimize excitation of higher order fiber modes in the LCMFOC (paragraphs [0051], [0055] , wherein the LCMFOC is designed to decrease higher order fiber modes (paragraph [0051]; Figure 9) which increase pulse spreading that limit the length/data rate product and to thereby increase a transmission distance through the LCMFOC and output second light pulses which include substantially only lower order fiber modes, wherein the LCMFOC comprises: an exposed core having the core diameter which receives the focused short light pulses (inherent in Figures 1 & 2). Numata differs from the claimed invention in that Numata fails to disclose two aspects of the claimed invention.

First, Numata fails to specifically teach using a step index fiber optic cable having a doped cladding layer for absorptive attenuation of higher order modes. However, Siegman, from the same field of endeavor discloses the use of a step index fiber optic cable having a doped cladding layer for absorptive attenuation of higher order modes (column 1 lines 36-47; column 3 lines 47-58; column 7 lines 60-61; column 11 lines 50-54; e.g. “index-antiguinding” throughout). One skilled in the art would have been motivated to employ a step index fiber optic cable having a doped cladding layer for absorptive attenuation of higher order modes in order to reduce the amount of mode mixing and randomizing of propagating modes to reduce dispersion (column 7 lines 1-15 of Siegman). Therefore, it would have been obvious to one skilled in the art at the

Art Unit: 2613

time the invention was made to use a step index fiber optic cable having a doped cladding layer for absorptive attenuation of higher order modes as taught by Siegman in the device of Numata.

Second, Numata fails to specifically teach that said light source transmits data at greater than 10 gigabits per second. However, Aoki teaches that this concept is well known in the art and common (column 1 lines 45-50). One skilled in the art would have been motivated to include a transmitter with the ability to transmit at greater than 10 gigabits in order to transfer a large amount of information in a short period of time. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include a light source that transmits data at greater than 10 gigabits per second.

Regarding claim 22, 32, and 35, Numata teaches that said lens (reference numeral 112 in Figure 1) focuses said first light signal to reduce an excitation of higher order modes generated in said LCMFOC.

Regarding claim 25, Numata teaches a receiver coupled to an opposing end of said large core multimode fiber optic cable for receiving said transmitted data (reference numeral 22 in Figure 7 of Numata).

Regarding claim 27, Numata teaches that the core diameter is greater than or equal to 50 microns (paragraph [0006]).

Regarding claim 28, the combination of references and Siegman in particular teaches that the LCMFOC comprises a selected step index LCMFOC (column 1 lines 36-47; column 3 lines 47-58; column 7 lines 60-61; column 11 lines 50-54)

9. Claims 23 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numata in view of Siegman (U.S. Patent No. 6,751,388) and Aoki (U.S. Patent No. 6,757,499), as applied to claims 21 and 26 above, and further in view of Edvold (U.S. Patent No. 6,724,956).

Regarding claims 23 and 29, the combination of Numata, Siegman, and Aoki differs from the claimed invention in that it fails to specifically teach that said light source provides light having a wavelength greater than 750 nanometers. However, Edvold teaches that the industry standard for transmitting light on fiber is 1550 nm with wavelengths typically in the 1530 to 1565 nm range (column 1 lines 28-44). One skilled in the art would have been motivated to transmit a wavelength at greater than 750 nanometers in an optical system due to favorable signal loss and dispersive properties at these wavelengths (Edvold column 1 lines 27-44). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to transmit a wavelength at greater than 750 nanometers in the optical system of the combination of references.

10. Claims 24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Numata in view of Siegman (U.S. Patent No. 6,751,388) and Aoki (U.S. Patent No. 6,757,499), as applied to claims 21 and 26 above, and further in view of White (U.S. Patent No. 6,476,951).

Regarding claims 24 and 30, the combination of references as applied to claims 21 and 26 differs from the claimed invention in that it fails to specifically discuss or disclose launching power to said LCMFOC at 20dBm or more. However, White teaches that this concept is well known in the art (column 7 lines 10-19). One skilled in the art would have been motivated to launch an optical signal at 20 dBm or more in order to compensate for the known attenuation of the signal by the fiber. Therefore, it would have been obvious to one skilled in the art at the time

Art Unit: 2613

the invention was made to launch an optical signal at 20 dBm or greater in the device of the combination of references.

11. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Numata in view of Siegman (U.S. Patent No. 6,751,388) and Aoki (U.S. Patent No. 6,757,499), as applied to claims 21, 26, and 34 above, and further in view of Edvold and White.

As noted above in the rejection of claims 23-24 and 29-30, the combination of Numata, Siegman, and Aoki obviates the transmission of data at a rate greater than 10 Gbps. However, the combination of references differs from the claimed invention in that it fails to specifically teach that the launch power is greater than 20dBm or that wavelengths greater than 750 nm are used.

However, Edvold teaches that the industry standard for transmitting light on fiber is 1550 nm with wavelengths typically in the 1530 to 1565 nm range (column 1 lines 28-44). One skilled in the art would have been motivated to transmit a wavelength at greater than 750 nanometers in an optical system due to favorable signal loss and dispersive properties at these wavelengths (Edvold column 1 lines 27-44). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to transmit a wavelength at greater than 750 nanometers in the optical system of the combination of references.

Furthermore, White teaches that launch power greater than 20dBm (column 7 lines 10-19) is well known in the art. One skilled in the art would have been motivated to launch an optical signal at 20 dBm or more in order to compensate for the known attenuation of the signal by the fiber. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to launch an optical signal at 20 dBm or greater in the device of the combination of references.

Response to Arguments

12. Applicant's arguments filed 03/17/08 have been fully considered but they are not persuasive.

Applicant argues that Numata fails to specifically teach a lens that is placed at a distance of approximately the focal length of the lens from the end of the cable. However, the examiner notes that applicant's claim language only requires the distance to be ***approximately*** the focal length of the lens from the end of the cable. With the term "approximately" being considered a relative term, the examiner contends that Numata clearly teaches that a lens is placed at a distance of approximately the focal length of the lens from the end of the cable.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a lens that is placed at a distance ***equal to*** or ***at*** the focal length of the lens from the end of the cable) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Next, applicant argues that Numata fails to specifically teach a lens that focuses the light from the source onto the end of the cable such that the diameter of the focused light is approximately equal to the core diameter. However, the examiner notes that applicant's claim language only requires the diameter to be ***approximately*** equal to the core diameter. With the term "approximately" being considered a relative term, the examiner contends that Numata clearly teaches that a lens that focuses the light from the source onto the end of the cable such that the diameter of the focused light is approximately equal to the core diameter.

Applicant further argues that the combination of Numata and Aoki fails to specifically teach that a sequence of short light pulses at a data rate of 10 *gigabytes* per second are used. However, as noted in the new 112 rejection above, the data rate does not appear to be supported by either the specification or the preamble of the claim.

Next, applicant argues that the combination of references and Siegman in particular fails to specifically teach that a refractive index of said exposed core is substantially real. However, as noted by applicant but clearly not appreciated by applicant, Siegman clearly teaches this limitation in the cited portions of Siegman's disclosure. For example, Siegman specifically notes that the index difference is entirely responsible for the real part of the square of the complex valued parameter. Applicant once again relies on a relative term, in this case “substantially,” to suggest something more specific. However, with “substantially” being the relative term that it is, the examiner has applied the broadest reasonable interpretation of it and concludes that these limitations are obviated by the combination of Numata and Siegman.

Given the above, the examiner maintains that the cited prior art continues to read on the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Agustin Bello/
Primary Examiner, Art Unit 2613